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EXAMINER

SHAH, UTPAL D

ART UNIT	PAPER NUMBER
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2625

DATE MAILED: 10/05/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/091,100	Applicant(s) LI ET AL.	
	Examiner Utpal D. Shah	Art Unit 2625	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-31 is/are pending in the application.
4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-20,24,25 and 29-31 is/are rejected.
- 7) ☒ Claim(s) 21-23 and 26-28 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 04 March 2002 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. ____. |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date <u>1/14/2003</u> . | 6) <input type="checkbox"/> Other: ____. |

DETAILED ACTION

Claim Objections

Claim 2 is objected to because of the following informalities: line 1 of claim 2 reads "process of claim 2". It should read "process of claim 1", as claim cannot be dependent on itself. Appropriate correction is required.

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

2. Claims 1,2,8,11-12,24 and 29-31 are rejected under 35 U.S.C. 102(b) as being anticipated by an article "Coarse to Fine Face Detection" by Fleuret et al. (Fleuret).

3. In regards to claim 1, a computer-implemented face detection process for detecting a person's face in an input image and identifying a face pose range into which the face pose exhibited by the detected face falls, comprising using a computer to perform the following process actions:

creating a database comprising a plurality of training feature characterizations, each of which characterizes the face of a person at a known face pose or a non-face; (page 11, figure 4, Fleuret discloses creating a training database of pose faces.)

training a plurality of detectors arranged in a pyramidal architecture to determine whether a portion of an input image depicts a person's face having a face pose falling within a face pose range associated with one of the detectors using the training feature characterizations; (page 6, para 1, Fleuret discloses a learning algorithm in bottom-up architecture. The examiner interprets pyramidal architecture to be top-bottom or bottom-up as disclosed by Fleuret.)

and wherein said detectors using a greater number of feature characterizations are arranged at the bottom of the pyramid, and wherein said detectors arranged to detect finer ranges of face pose are arranged at the bottom of the pyramid; (page 25, para 5, Fleuret discloses decomposing the set of poses into finer subsets.)

inputting a portion of an input image into the plurality of detectors arranged in a pyramid architecture; and interpreting the output of the plurality of detectors to determine whether the portion of the input image contains a face and if so to identify the pose associated with each detected face. (page 5, para 2, Fleuret discloses a coarse to fine face detection technique.)

4. In regards to claim 3, Fleuret discloses wherein the process action of creating a database comprises the actions of: capturing training images of faces of a plurality of people at a variety of face poses; and preprocessing said images to prepare them for input into the plurality of detectors arranged in a pyramid architecture. (page 11, figure 4, Fleuret discloses creating a set of training images out of an original database.)

5. In regards to claim 8, Fleuret discloses wherein said detectors at the bottom of the pyramid using a greater number of feature characterizations and arranged to detect finer ranges of face pose are more complex. (page 5, para 2, Fleuret discloses a coarse to fine algorithm that increases in complexity at the bottom levels.)

6. In regards to claim 11, Fleuret discloses wherein each detector is designed to detect one face pose range associated with that detector. (page 16, para 2, Fleuret discloses that the learning of the detector dedicated to one cell of poses.)

7. In regards to claim 12, Fleuret discloses wherein the face pose range of a detector may partially overlap the face pose range associated with another detector. (page 10, table 1, Fleuret discloses that the pose range between middle group and bottom group overlap.)

8. In regards to claim 24, Fleuret discloses wherein the process action of inputting a portion of an input image into the plurality of detectors arranged in a pyramid architecture comprises: inputting a portion of the input image into a first detector layer; if the portion of the input image is rejected by the detector at the top layer, it is classified as a non-face region it is not processed by detectors in later detector layers; if the portion of the input image is processed by the detectors in the first detector layer, it is processed by the second layer, if a detector in the second layer classifies the input image portion as a non-face region it is not processed by detectors in the third layer; if

the portion of the input image is processed by the detectors in the second detector layer, it is processed by the third detector layer, which classifies the input image region into a face pose range corresponding to a detector trained to detect a given face pose range. (page 28, para 2, Fleuret discloses that the coarse to fine face pose detection algorithm is efficient because none of the finer test are performed before coarser ones have failed to eliminate image and the processing stops when face is detected.)

9. Claim 29 recites limitations that are similar and in the same scope of invention as to those in claim 1 above in paragraph 3 and combinations thereof; therefore, claim 29 is rejected for the same rejection as described in claim 1.

10. In regards to claim 30, A computer-readable medium having computer-executable instructions for detecting a person's face in an input image, said computer executable instructions comprising:

creating a database comprising a plurality of training feature characterizations, each of which characterizes the face of a person at a known face pose or a non-face; training a plurality of detectors arranged in a pyramidal architecture to determine whether a portion of an input image depicts a person's face having a face pose falling within a face pose range associated with one of the detectors using the training feature characterizations, (page 11, figure 4, Fleuret discloses creating a training database of pose faces. Fleuret further discloses on page 6, para 1, a learning algorithm in bottom-

up architecture. The examiner interprets pyramidal architecture to be top-bottom or bottom-up as disclosed by Fleuret.)

said plurality of detectors when trained being capable of determining whether a portion of an input image depicts a person's face; and wherein said detectors using a greater number of feature characterizations are arranged at the bottom of the pyramid, and wherein said detectors arranged to detect finer ranges of face pose are arranged at the bottom of the pyramid. (page 25, para 5, Fleuret discloses decomposing the set of poses into finer subsets.)

11. Claim 31 recites limitations that are similar and in the same scope of invention as to those in claim 30 above in paragraph 10 and combinations thereof; therefore, claim 31 is rejected for the same rejection as described in claim 30.

Claim Rejections - 35 USC § 103

12. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

13. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.

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2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

14. Claims 2,4-7,9-10 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over an article "Coarse to Fine Face Detection" by Fleuret et al. (Fleuret) in view of an article "Robust Real-Time Object Detection" by Viola et al. (Viola).

In regards to claim 2, Fleuret discloses all the claimed limitations of claim 1, as discussed above in paragraph 3 and incorporated herein by reference.

Fleuret does not expressly disclose wherein each of said detectors of said plurality of detectors comprises at least one classifier, said at least one classifier employing a unique feature that characterizes a face with poses within the range of the detector, each classifier of the detector determined by employing a statistical process to identify the classifier or classifiers that best indicates that the portion of the input image under consideration is a face in the pose range associated with the detector.

However, Viola discloses wherein each of said detectors of said plurality of detectors comprises at least one classifier, said at least one classifier employing a unique feature that characterizes a face with poses within the range of the detector, each classifier of the detector determined by employing a statistical process to identify the classifier or classifiers that best indicates that the portion of the input image under consideration is a face in the pose range associated with the detector. (page 7, para 1, Viola discloses that the learning algorithm can be a simple perceptron. The examiner would like to assert that perceptron is statistical classifier.)

Fleuret & Viola are combinable because they are from the same field of endeavor i.e. face detection. (title)

At the time of the invention, it would have been obvious to a person of ordinary skill in the art to modify Fleuret with the teachings of Viola.

The suggestion/motivation for doing so would have been to least increase the speed of face detection in practical applications. (page 1, para 4)

Therefore, it would have been obvious to combine Fleuret with Viola to obtain the invention as specified in claim 2.

15. In regards to claim 4, Fleuret discloses all the claimed limitations of claim 3, as discussed in paragraph 4 and incorporated herein by the reference.

Fleuret further discloses categorizing the normalized and cropped training images according to their face pose by grouping the images into a set of pose ranges. (page 11, figure 4, Fleuret discloses categorizing the poses in three different categories.)

Fleuret does not expressly disclose normalizing each training image by resizing it to a prescribed scale if not already at the prescribed scale and adjusting the region so that the eye locations of the depicted subject fall within a prescribed area;

cropping each training image to eliminate unneeded portions not specifically depicting part of the face of the subject;

However, Viola discloses normalizing each training image by resizing it to a prescribed scale if not already at the prescribed scale and adjusting the region so

that the eye locations of the depicted subject fall within a prescribed area; (page 16, section 5.1, Viola discloses scaling and aligning images for the training dataset.)

cropping each training image to eliminate unneeded portions not specifically (page 16, section 5.1, Viola discloses cropping the images tightly around the face.)

16. In regards to claim 5, Fleuret discloses all the claimed limitations of claim 1, as discussed in paragraph 3 and incorporated herein by the reference.

Fleuret does not expressly disclose wherein each detector is constructed based on one or more weak classifiers.

However, Viola discloses wherein each detector is constructed based on one or more weak classifiers. (page 7, para 1, Viola discloses that a learning algorithm is used to boost the performance of a weak classifier.)

17. In regards to claim 6, Fleuret and Viola disclose all the claimed limitations of claim 5, as discussed in paragraph 16 and incorporated herein by reference.

Fleuret does not expressly disclose wherein each classifier performs face/non-face classification using a different single feature.

However, Viola discloses wherein each classifier performs face/non-face classification using a different single feature. (page 7, para 4, Viola disclose that the classifier separates the images into positive and negative examples using a single feature. The examiner would like to assert that the positive and negative images are face/non-face images respectively.)

18. In regards to claim 7, Fleuret discloses all the claimed limitations of claim 1, as discussed in paragraph 3 and incorporated herein by the reference.

Fleuret does not expressly disclose wherein each detector can be one of:

a single face/non-face classifier;

and a cascade of face/non-face classifiers.

However, Viola discloses wherein each detector can be one of:

a single face/non-face classifier; (page 7, para 1, Viola discloses constructing a single strong classifier by combining weak classifier.)

and a cascade of face/non-face classifiers. (page 9, section 4, Viola discloses constructing a cascade classifier.)

19. In regards to claim 9, Fleuret discloses all the claimed limitations of claim 1, as discussed in paragraph 3 and incorporated herein by the reference.

Fleuret does not expressly disclose wherein training the detectors comprises one of: using a Gaussian model; using a small set of simple image features and a neural network; using a boosting algorithm; and using a support vector machine.

However, Viola discloses wherein training the detectors comprises one of: using a Gaussian model; using a small set of simple image features and a neural network; using a boosting algorithm; and using a support vector machine. (page 7, para 1, Viola discloses learning algorithm based on boosting.)

20. In regards to claim 10, Fleuret discloses all the claimed limitations of claim 1, as discussed in paragraph 3 and incorporated herein by the reference.

Fleuret further discloses at each level of the pyramid, partitioning the full range of face poses into a number of sub-ranges and training the same number of detectors for face detection in each partition, each detector specialized for a certain pose sub-range; (page 5, para 2, Fleuret discloses that the algorithm starts with simple and sparse poses, and eventually moving to a more specific poses.)

and composing the detector-pyramid of several levels from the coarsest view partition at the top to the finest view partition at the bottom. (page 28, figure 10, Fleuret discloses that the finest view is at the bottom.)

Fleuret does not expressly disclose designing a set of simple features; selecting a subset of the set of simple features; training a set of weak classifiers using said subset of features; constructing a strong classifier from a linear combination of weak classifiers;

However, Viola discloses designing a set of simple features; selecting a subset of the set of simple features; training a set of weak classifiers using said subset of features; constructing a strong classifier from a linear combination of weak classifiers; (page 8, table 1, Viola discloses using single feature to train a weak classifier and the final strong classifier is linear combination of the weak classifiers.)

21. In regards to claim 12, Fleuret discloses all the claimed limitations of claim 11, as discussed in paragraph 6 and incorporated herein by reference.

Fleuret does not expressly disclose wherein the face pose range of a detector may partially overlap the face pose range associated with another detector.

However, Viola discloses wherein the face pose range of a detector may partially overlap the face pose range associated with another detector. (page 19, section 5.6, Viola discloses

22. Claims 13-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over an article "Coarse to Fine Face Detection" by Fleuret et al. (Fleuret) in view of an article "Support Vector Regression and Classification Based Multi-View Face Detection and Recognition" by Li et al. (Li).

In regards to claim 13, Fleuret discloses all the claimed limitations of claim 1, as discussed in paragraph 3 and incorporated herein by reference.

Fleuret does not expressly disclose wherein detectors only on one side of the detector pyramid are trained, and detectors on the other side of the pyramid are deemed to be the mirrors of the trained side.

However, Li discloses wherein detectors only on one side of the detector pyramid are trained, and detectors on the other side of the pyramid are deemed to be the mirrors of the trained side. (page 302, left col., section 3.2, Li discloses modeling detectors either left or right view faces.)

Fleuret & Li are combinable because they are from the same field of endeavor i.e. multi-view face detection. (title)

At the time of the invention, it would have been obvious to a person of ordinary skill in the art to modify Fleuret with the teachings of Li.

The motivation for doing so would have been to simplify the complexity of modeling the detector. (abstract)

Therefore, it would have been obvious to combine Fleuret with Li to obtain the invention as specified in claim 13.

23. In regards to claim 14, Fleuret and Li disclose all the claimed limitations of claim 13, as discussed in paragraph 22 and incorporated herein by reference.

Fleuret does not expressly disclose wherein the training time of training the detectors of the detector pyramid is cut in half because only the detectors on one side of the detector pyramid are trained.

However, Li discloses wherein the training time of training the detectors of the detector pyramid is cut in half because only the detectors on one side of the detector pyramid are trained. (abstract, Li discloses that using the symmetrical property of face images reduce computational time.)

24. In regards to claim 15, Fleuret discloses all the claimed limitations of claim 1, as discussed in paragraph 3 and incorporated herein by reference.

Fleuret does not expressly disclose wherein the process action of inputting a region from the input image comprises the action of: partitioning said input image into sub-windows.

However, Li discloses wherein the process action of inputting a region from the input image comprises the action of: partitioning said input image into sub-windows. (page 301, right col., para 7, Li discloses that sub-image of a original image is fed into multi-view face detector.)

25. Claims 16-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fleuret and Li, as applied to claim 15, further in view of an article "Neural Network-Based Face Detection" by Rowley et al. (Rowley).

In regards to claim 16, Fleuret and Li disclose all the claimed limitations of claim 15, as discussed in paragraph 24 and incorporated herein by the reference.

Fleuret and Li do not expressly disclose wherein said partitioning of said input image into sub-windows comprises moving a search window of a prescribed size across the input image and prior to each shift extracting the pixels contained within the search window to create an input image region.

However, Rowley discloses wherein said partitioning of said input image into sub-windows comprises moving a search window of a prescribed size across the input image and prior to each shift extracting the pixels contained within the search window to create an input image region. (page 23, right col., section 2.1, Rowley discloses applying a filter or search window at every location in the image.)

Fleuret and Li & Rowley are combinable because they are from the same field of endeavor i.e. face detection. (title)

At the time of the invention, it would have been obvious to a person of ordinary skill in the art to modify Fleuret and Li with the teachings of Rowley.

The motivation for doing so would have been at least increase the performance of the face detection technique. (abstract)

Therefore, it would have been obvious to combine Fleuret and Li with Rowley to obtain the invention as specified in claim 16.

26. In regards to claim 17, Fleuret, Li and Rowley disclose all the claimed limitations of claim 16, as discussed in paragraph 25 and incorporated herein by the reference.

Fleuret and Li do not expressly disclose employing a search window having a size approximately equal to the size of the smallest face it is anticipated will be depicted in the input image and which it is desired to detect; after regions from every part of the input image it is desired to screen for faces have been extracted, reducing the size of the input image by a prescribed scale increment; progressively shifting the search window across the reduced input image and prior to each shift extracting the pixels contained within the search window to create an input image region; and repeating the reducing and shifting process actions until a prescribed reduction limit is reached.

However, Rowley discloses employing a search window having a size approximately equal to the size of the smallest face it is anticipated will be depicted in the input image and which it is desired to detect; after regions from every part of the input image it is desired to screen for faces have been extracted, reducing the size of the input image by a prescribed scale increment; progressively shifting the search

window across the reduced input image and prior to each shift extracting the pixels contained within the search window to create an input image region; and repeating the reducing and shifting process actions until a prescribed reduction limit is reached. (page 24, figure 1, Rowley disclose the face detection technique, which shows reducing the size and extracting window)

27. In regards to claim 18, Fleuret, Li and Rowley disclose all the claimed limitations of claim 16, as discussed in paragraph 25 and incorporated herein by the reference.

Fleuret and Li do not expressly disclose wherein the search window size corresponds to the size of the training images.

However, Rowley discloses wherein the search window size corresponds to the size of the training images. (page 24, figure 1, Rowley discloses that the extracted window, which is inputted to the face detection network, is the same size as the search window.)

28. In regards to claim 19, Fleuret, Li and Rowley disclose all the claimed limitations of claim 16, as discussed in paragraph 25 and incorporated herein by the reference.

Fleuret and Li do not expressly disclose wherein the search window size is the size of the smallest detectable face anticipated to be found in the input image.

However, Rowley discloses wherein the search window size is the size of the smallest detectable face anticipated to be found in the input image. (page 24, figure 1)

29. In regards to claim 20, Fleuret, Li and Rowley disclose all the claimed limitations of claim 16, as discussed in paragraph 25 and incorporated herein by the reference.

Fleuret and Li do not expressly disclose wherein the search window size is 20 by 20 pixels.

However, Rowley discloses wherein the search window size is 20 by 20 pixels.
(page 24, figure 1)

30. Claim 25 is rejected under 35 U.S.C. 103(a) as being unpatentable over Fleuret, as applied to claim 1, further in view of an article "Neural Network-Based Face Detection" by Rowley et al. (Rowley).

In regards to claim 25, Fleuret discloses all the claimed limitations of claim 1, as discussed in paragraph 3 and incorporated herein by the reference.

Fleuret does not expressly disclose wherein inputting a portion of an input image into the plurality of detectors arranged in a pyramid architecture further comprises arbitrating between two or more detectors that detect a face in the same detector layer to determine if the detections represent two different faces or two detections of one face.

However, Rowley discloses wherein inputting a portion of an input image into the plurality of detectors arranged in a pyramid architecture further comprises arbitrating between two or more detectors that detect a face in the same detector layer to determine if the detections represent two different faces or two detections of one face.

(page 27, left col., section 2.2.2, Rowley discloses arbitrating between more than one outputs to produce the final decision.)

Fleuret & Rowley are combinable because they are from the same field of endeavor i.e. face detection. (title)

At the time of the invention, it would have been obvious to a person of ordinary skill in the art to modify Fleuret with the teachings of Rowley.

The motivation for doing so would have been at least increase the performance of the face detection technique. (abstract)

Therefore, it would have been obvious to combine Fleuret with Rowley to obtain the invention as specified in claim 25.

Allowable Subject Matter

31. Claims 21-23 and 26-28 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

32. In regards to claim 21, the closest prior arts Fleuret, Li and Rowley disclose all the claimed limitations of claim 16. However, the closest prior arts fail to teach, "wherein the initial search window size is increased by a scale factor in a step-wise fashion all the way up to the input image size; and after each increase in scale partitioning the input image with the search sub-window size." It is for this reason that claim 21 would be allowable if written in independent form.

33. In regards to claim 22, the closest prior arts Fleuret, Li and Rowley disclose all the claimed limitations of claim 16. However, the closest prior arts fail to teach, "wherein the original sub-window size matches the entire image and this sub-window is then scaled down on an incremental basis." It is for this reason that claim 22 would be allowable if written in independent form.

34. In regards to claim 23, the closest prior art Fleuret discloses all the claimed limitations of claim 1. However, the closest prior art fails to teach, "wherein the detector pyramid architecture comprises three detector layers and wherein said first detector layer comprises a single full-view detector responsible for the full range of -90 to 90 degrees of face pose, with 0 degrees being frontal view; said second detector layer comprises a first, second and third detector, said first detector being capable of detecting face pose ranges of -90 to 40 degrees, said second detector being capable of detecting face pose ranges of -30 to 30 degrees, and said third detector being capable of detecting face pose range of 40 to 90 degrees; said third detector layer comprising nine detectors, capable of detecting face pose ranges of -90 to -80 degrees, -70 to -60 degrees, -50 to -40 degrees, -30 to -20 degrees, -10 to 10 degrees, 20 to 30 degrees, 40 to 50 degrees, 60 to 70 degrees, and 80 to 90 degrees, respectively." It is for this reason claim 23 would be allowable if rewritten in independent form.

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35. In regards to claim 26, the closest prior arts Fleuret and Rowley disclose all the claimed limitations of claim 25. However, the closest prior arts fail teach, "wherein arbitrating between two or more detectors further comprises determining if the detections by each of the two or more detectors overlap; specifying that if the detections by each of the two or more detectors do not overlap then arbitration is not necessary and each face detection is determined to be a separate face; combining the output of some of the detector view ranges into one class by creating new classes of view ranges from the various pose range detectors at the detector pyramid's outputs; arbitrating between the new classes of view ranges to categorize each overlapping detection into one of the new classes of view ranges." It is for this reason claim 26 would be allowable is rewritten in independent form.

36. In regards to claim 27, claim 27 is dependent on claim 26, so it is allowed.

37. In regards to claim 28, claim 28 is dependent on claim 27, so it is allowed.

Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Utpal D. Shah whose telephone number is 571-272-8568. The examiner can normally be reached on M-F (9 AM - 5:30 PM).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Bhavesh Mehta can be reached on 571-272-7453. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Utpal Shah
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